May 12, 1971

Dr. Marvin A. Schneiderman
Associate Scientific Director
for Demography (Acting)
National Cancer Institute
Bethesda, Maryland 20014

Dear Dr. Schneiderman,

Thank you for your comments of May 6th about my piece in the Washington Post, May 2. Needless to say, it was hardly feasible to develop a detailed quantitative argument in that vehicle. Of course I agree with you that one must calculate differential rather than integral costs in assessing the risks of ~~incremental~~ radiation exposure. We also have to consider many other more complicated interactions - is the fraction of the population that will receive the highest exposures likely to be biased towards higher or lower vulnerability to radiation on account of other genetic and environmental factors? However, if nuclear energy is in fact going to be kept within a 1 millirad average limit a large part of the recent debate should evaporate. If we are going to be concerned about 1 millirad increments there are obviously many more cogent targets for that concern.

There still remain all the other problems of safeguard against major catastrophies which I do not feel very competent to judge. And, of course, besides the problem of populational hazards there must also be standards for individual exposure - we could hardly justify involuntary risks without compensation. However, as I tried to bring out with my example of the "10 millirad householder" there are levels of risk which remain socially important although individually inconsequential.

A great deal of my thinking on the question can be summarized with the surmise that the differential cost of radiation is about $100 per man-rad. If you think this is low by a factor of 10 it still would not particularly alter our policy conclusions. If it underestimates the ~~same~~ true cost by a factor of 100, about which I would be skeptical, we would have to start thinking about shielding ourselves from the natural background, altitude effects, and alike. I do not see that the calculated differences between integral and differential costs could matter anything like a factor of 10.

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I would certainly agree that "unnecessary diagnostic radiation" is the most relevant target for our concern at the present time. I am not sure that we have a clear picture of the individual and social benefits of most of that radiation, of the kind that we would need to have to label it as "unnecessary". Certainly this needs to be looked into very carfully. I would very strongly support stringent regulations on that kind of radiation exposure which is unnecessary insofar as it is a byproduct of technical stinginess and makes no contribution whatever to the diagnostic process. Suggested regulations requiring x-ray machines to be equipped with field-defining devices should have a very high priority and would be very easy to justify on the basis of the $100 per man-rad criterion.

Sincerely yours,

Joshua Lederberg
Professor of Genetics

JL/rr